Creation Matters

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The Bat's Tale at Carlsbad Caverns

by Dave Woetzel

The October 1953 issue of *National Geographic* published a 35-page pictorial overview of Carlsbad Caverns. One of the 33 photos displayed a bat encased in a stalagmite. [Figure 1] The caption stated: "This bat, falling on a stalagmite, became firmly cemented as the stone grew. Feet are buried; the head hangs down; wing bones show up darkly." (Sutherland, 1953, p. 442)

This intriguing picture became iconic in creation science circles since it illustrated the rapidity with which stalagmites can form under optimal circumstances. Dr. Silvestru notes that this bat "has some preserved tissue besides bones, evidence it was covered rather quickly." (Silvestru, 2008, p. 68) This negates the simplistic uniformitarian notion that speleothems, such as stalactites and stalagmites, must be hundreds of thousands to several million years old because they typically grow so slowly in the present.

Over the years, the mainstream story of the age of the speleothems (calcite formations) at Carlsbad Caverns has continued to evolve and new evidence is making the creationist point even more evident.

Historical Review

A 1937 National Park Service (NPS) bulletin discusses the Carlsbad limestone: "This limestone was formed originally in a shallow inland extension of the ocean some 200 million years ago…." (Story, 1937, p. 1) The article goes on to describe the carving of this ancient limestone to form the cave shortly after the region was uplifted about 60 million years ago.

The 1953 *National Geographic* article declares that Carlsbad Caverns are millions of years old (Sutherland, 1953, p. 437). But it does note that the mineral formations stand on top of geologically recent material. "Few of these secondary formations can exceed 100,000 years, for many rest on silt and fossils believed to be of that age." (Sutherland, 1953, p. 446) Perhaps Mason Sutherland realized the incongruity of the old assigned age and the photo of the bat preserved in the Papoose Chamber at Carlsbad.

In a 2001 report published in the journal *Science,* geologists Polyak and Provencio theorized that the Carlsbad Caverns was carved out of ancient limestone by hot, rising water enriched with sulfuric acid (Polyak and Provencio, 2001). Polyak, et al. (1998) calculated that the cavern's largest rooms were only about 4 million years old. What about the speleothems? The most common method of dating these calcite formations is uranium-thorium (U-Th) disequilibrium dating, and Brook, et al. (2006) reported on 46 Carlsbad speleothems that were dated using this method and yielded ages from 12,500 years to 164,000 years. They note that there have been high amounts of variability in stalagmite growth (0–70 mm/kyr) throughout glaciation.

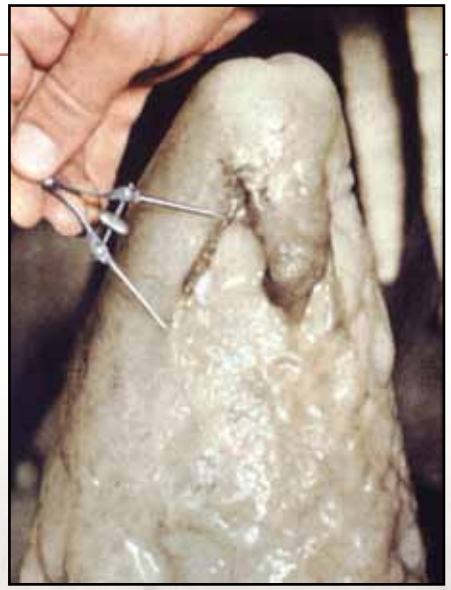

Figure 1. *National Geographic* photo of a bat in a stalagmite (Courtesy of Don Patton)

Perceptive visitors to Carlsbad Caverns have noted the evolving story of the signage. "The visitors' sign originally said the room was at least 260 million years old, but it was changed in 1988 to read 7–10 million years, later 2 million years, and now it's gone." (Matthews, 2018, p. 70) During my visit, park rangers gave a variety of answers when I inquired about the age of the cavern, ranging from "millions of years" to "we don't know." [Figure 2]

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Math Matters

Ants and Traveling Salesmen

by Don DeYoung, PhD

The Traveling Salesman Problem, TSP for short, is a classic question first described decades ago. It asks the shortest possible route in visiting a list of cities and returning to the starting point, knowing the distance between each pair of cities. It is not a trivial problem; the number of possible routes for N cities, beginning and ending at any one of them, increases rapidly and is given by (N – 1)! So, for five cities (N=5) there are 4! (four factorial) routes, which is 4x3x2x1, or 24.

The table shows the number of distinct routes in visiting N cities. The solution to the TSP problem by computing all possible routes quickly becomes impossible as the number of cities increases. Yet this problem is faced every day by delivery vehicles with dozens of stops. Other applications vary widely: The steps in manufacturing microchips, steering a large telescope through a series of targets, sequencing DNA strands, finding faults in communication networks, and advising fighter pilots under multiple simulated attacks. In some cases the distance variable of TSP is replaced by cost, time or order of priority.

Many shortcut approximations have been developed for the traveling salesman problem, none of them exact. Now, in addition, the lowly ant provides insight for TSP solutions. It is observed that an ant colony optimizes the shortest path to a food source. Perhaps you have watched ants which appear to forage erratically. Along the way, however, they emit chemical pheromones which other ants follow. Ants which happen to choose the shortest path to a food source return to the nest before others, leaving a strong signal. Chemical traces from longer food paths evaporate over time. The net result is a preferred, marked food path, whether it is on the lawn or perhaps across the kitchen counter.

N cities	Routes (N – 1)!
3	2
4	6
5	24
7	720
10	362,880
25	$\sim 6.2 \times 10^{23}$
30	$\sim 8.8 \times 10^{30}$
50	$\sim 6.08 \times 10^{62}$
100	$\sim 9.3 \times 10^{157}$

In practice, engineers use a technique called Ant Colony Optimization. The "ant analog" agents are short software programs with simple rules or algorithms, often proprietary. The "software ants" interface with near neighbors via electrical signals similar to chemical traces. These ant-analog components rapidly search data bases or minimize computing operations and give optimum solutions to TSP-type problems.

Software ants are an example of biomimicry, the solution to technical problems by observing nature, in this case the "swarm intelligence" ants. The Creator has inserted endless practical ideas in creation that await our discovery and application. CM

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Bat's Tale

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But NPS material still presents the public with a dated story of a more ancient age. A 2020 pamphlet distributed by the Park Service states: "The bulk of speleogenesis that created the modern karst systems and features at CAVE occurred within the last 12 million years. The origin, timing, and process of this speleogenesis is complex, subject to ongoing debate, and beyond the scope of this paleontologic inventory." (Kottkamp, 2020, p. 19) This document displays a bat skeleton incorporated into flowstone on the front cover [Figure 3]. A black and white version of the classic photo of the bat in a stalagmite appears on p. 29. How can such an ancient cave age estimate be reconciled with apparent rapid speleothem growth?

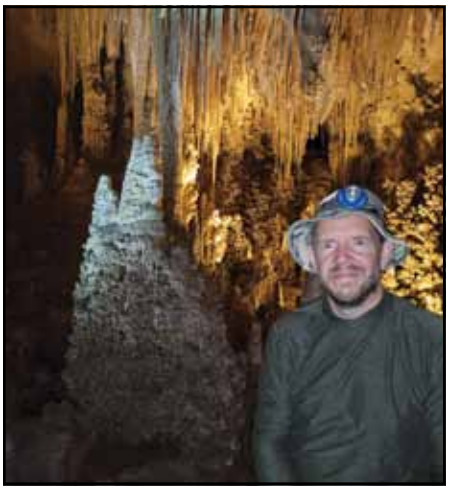

Figure 2. Author at Carlsbad

Speleothem Creation

The NPS website states, "Today, few speleothems inside any Guadalupe Mountains caves are wet and actively growing. This is a direct result of the dry desert climate. Most speleothems inside Carlsbad Cavern would have been much more active during the last ice age—up to around 10,000 years ago—when the Guadalupe Mountains received a great deal more rainfall than what today's desert climate receives." (Nps.gov, 2017)

Creationists would agree with most of this statement. They have made the case that massive caves like Carlsbad were carved out rapidly and catastrophically during the recessional stage of the Genesis Flood. Nelson (2020) provides hundreds of modern structures that contain rich calcium carbonate deposits, including stalactites and stalagmites under bridges, tunnels, pipes, mines, etc. We know these formations can grow rapidly. Silvestru (2012, p. 46) makes the potent point that it is not reasonable to posit a stable drip source over hundreds of thousands of years fueling the growth of a particular speleothem. The evidence continues to grow that speleothems were made rapidly and catastrophically.

Figure 3. NPS cover photo of a bat skeleton in a speleothem

The mineral formations might have begun to appear fairly soon after the Flood waters drained off. Michael Oard (2020a and 2020b) makes the case that much of the cave decorations likely appeared during the post-Flood Ice Age when conditions would seem to be optimal for speleothem growth. By then, there might have been a significant population of bats inhabiting the Carlsbad Caverns. So, it is quite plausible that some of them could have become incorporated into a quick-forming flowstone just a few thousand years ago. This stands in stark contrast with the NPS website which states that Carlsbad decorated itself drip-by-drip, over the past million years or so (Nps.gov, 2017).

The Bat's Tale

Currently, Carlsbad is home to approximately half a million bats. There are over a dozen species, but the overwhelming majority are Brazilian free-tailed bats. These bats are so named because their tail extends about an inch beyond their uropatagium (the posterior membrane between the two hindlimbs). Indeed, it was the flight of the bats that arrested the attention of young Jim White in 1901. The teenage cowboy stopped his horse in the area because of a strange sight that he saw behind the hill. Rising from the ground was what seemed to be a lot of smoke. He turned and galloped over to investigate it. To his surprise he found out that the "smoke" was actually millions of bats flying from a huge hole in the ground. [Figure 4] Later, he took old barbwire fence and twisted it around sticks to make a ladder to get down into the cave. White made Carlsbad Caverns his lifelong obsession, guiding groups down to see the underground wonders. In the 1920s Carlsbad Caverns was declared a national monument. But it remained in obscurity until the *National Geographic* articles in 1924 and 1925

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brought the vast caverns to the attention of a wider audience.

Occasionally whole bats are preserved in the driest portions of the cave. "Bat mummies occur within several different areas of Carlsbad Cavern. One grotto contains several mummified bats. Most are well preserved and some still hang from the walls, ceilings, and cave formations…. The room's isolated and unusually dry climate are proposed explanations for the mummies." (Kottkamp, 2020, p. 52)

From 1927–1946 Col. Thomas Boles was Superintendent of the Caverns. He effectively promoted Carlsbad, and a steady stream of visitors came annually. By 1952, attendance at Carlsbad rose to 530,000 visitors annually. As interest continued to grow, *National Geographic* determined to do another significant article on the underground wonder, hence the 1957 piece by Sutherland. Carlsbad is one of the world's deepest, biggest, and most decorated caves. The many underground rooms go for more than 30 miles. The deepest part, called the Bottomless Pit, is 1,027 feet below the surface. The famous Big Room is 14 acres in size! The Bat Cave is the primary home of the hundreds of thousands of bats, and their evening flight out of the natural cave opening has become a major tourist attraction at Carlsbad.

I visited Carlsbad Caverns in March of 2021 with the objective of personally investigating the famous bat encrusted in a stalagmite. At the time, the trail to the Papoose Chamber was closed due to COVID. But helpful park rangers showed me two other bats incorporated into formations. The first was on a slight shelf made by a waterfall formation. Apparently an aged or sick bat had landed on this fairly flat flowstone and died. Its bones became incorporated into the sheet flow. [Figure 5] The second preserved bat was more difficult to photograph. It is entombed in a large popcorn formation. The bat remains are in a cavity behind the popcorn. [Figure 6]

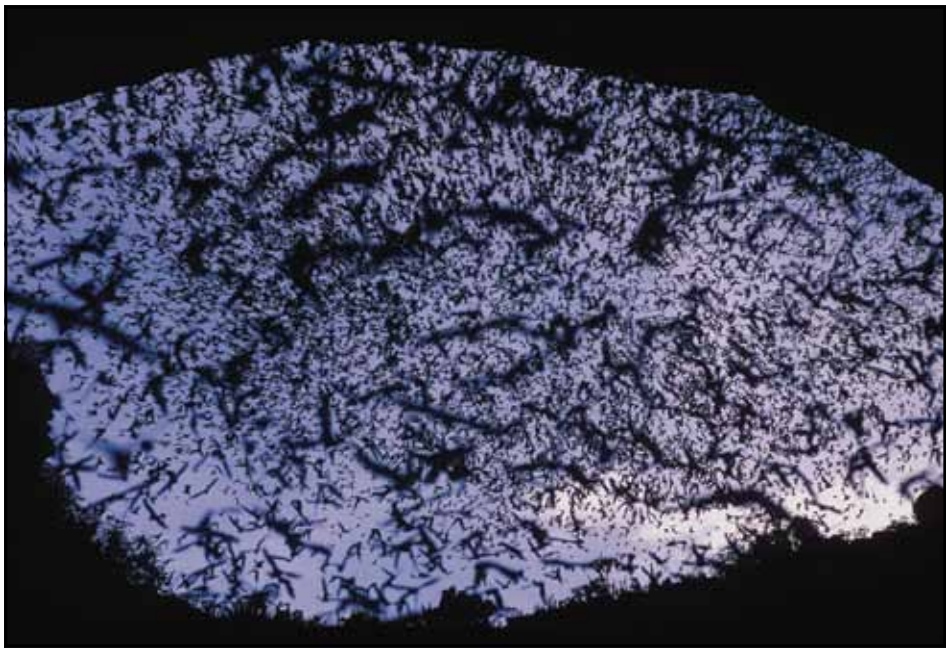

Figure 4. Bats exiting Carlsbad (Photo by NPS)

How Significant for Creation Science is a Bat Enclosed in a Speleothem?

The bat remains I observed in the flowstones were only bones. Clearly, such skeletal remains can last millennia, especially in a cool cave environment. The active, wet years would reduce bone life, but for many centuries New Mexico has been arid. Hence most of the speleothems are dormant and the cave is fairly dry. Land et al. (2006) claim that bat skeletons littering the floor with hundreds of thousands of bones are likely more than half a million years old. Since the cave is a very stable 13°C, measured collagen decay rates do suggest that bone could last over 100,000 years. But it is not plausible that these bones would last a million years as speleothems slowly formed.

Figure 5. Bat encased in waterfall formation

While I was at Carlsbad, I learned of an unusual bat fossil in the Lower Cave. This bat is completely entombed inside a stalagmite. [Figure 7] The large speleothem is part of the Colonel Boles Formation. The only way to see this bat

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is to backlight the flowstone and illuminate the bat's remains in the translucent speleothem (kind of like an insect in amber). But the fascinating thing is that it appears to retain the soft tissue. [Figure 6] Skeletons might conceivably last for hundreds of thousands of years. But soft tissue certainly would have decayed in short order. Moreover, cave crickets scavenge the flesh off bats that die and land on the floor of the cave.

There is even a slight discoloration below the body of the bat. Perhaps this was due to leaking of decaying flesh and body tissue as the wet stalagmite formed around the dead bat; if so, this stalagmite must have formed very quickly indeed. Under the right conditions, even large calcite formations can be built in a matter of centuries. This fits very well with the Creation/Flood model.

Conclusion

In conclusion, it seems that the mainstream interpretation of speleothems at Carlsbad has become more nuanced over the decades. There is a greater recognition of the variability of mineral growth rates. Moreover, the assigned age of Carlsbad Caverns has been greatly reduced. Nonetheless, the bats incorporated into flowstone remain useful evidence to counter those remaining uniformitarians who persist in arguing that speleothems require millions of years to form. And a bat with soft tissue preserved is especially potent evidence for rapid formation, much quicker than the mainstream scientific community will acknowledge.

Acknowledgments

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Figure 6. Bat behind popcorn formation

Figure 7. Bat entombed in translucent stalagmite exhibiting soft tissue preservation (Photo by NPS)

For over 50 years, the Creation Research Society has been a leader in conducting and sponsoring creation research. Not only do we have our own research projects (iDino and eKINDS) and facilities, but CRS members can apply for research grants for conducting research on topics relevant to origins issues. For more information on applying for grants or helping to fund creation research, please contact us at vacrc@creationresearch.org, by phone at 928-636-1153, or by mail at CRS Van Andel Creation Research Center, 1 W. Firestorm Way #145, Glendale, AZ 85306.

Summaries of Cutting-edge Research from *Creation Research Society Quarterly*

Summaries compiled by Jean K. Lightner, DVM, MS

It is crucial for creation research to investigate the world around us while engaging the current scientific literature and Scripture as we build the creation model in various scientific fields. CRS exists to support and publish such research. Only through high quality research can we equip Christians with strong, sound apologetic arguments that demonstrate the robustness of the creation model in understanding the world around us.

Binary Stars Testify to Their Creator

Scripture tells us the heavens declare the glory of God (Psalm 19:1). Yet, we live in a culture that has devised its own history of the universe, and attempts to fit observations into this naturalistic framework that denies the need for God. It is common for the same observations to be cited as evidence for competing narratives. However, as more details are uncovered, it is evident that many observations do not fit well in the modern naturalistic cosmology (origins myth). This can provide a great opening for creation researchers to focus their efforts.

Astronomer Dr. Ron Samec has noted that the patterns of change in binary stars do not fit well within the conventional paradigm. In the systems he has studied, two stars rotate around a center so that one star will eclipse the other as it moves in front of our view. As these systems age, the stars draw closer together and the time it takes to circle around each other, the period, becomes shorter. As he has reported before, these stars are drawing closer to each other around 400 times faster than the conventional model would predict.

In the Summer 2020 issue of the *Creation Research Society Quarterly* (*CRSQ*), Dr. Samec and his students present observational data on eleven different binary systems (Samec et al., 2020). In addition to providing more data, there is an analysis of how these data fit within a biblical history. There are several creation cosmologies. Samec et al. (2020) consider the popular time-dilation cosmology proposed by Dr. Russ Humphreys. They find that despite an "appearance of age" that is predicted in the time-dilation cosmology, these systems fit well within the biblical history.

Samec, R.G., A. Olsen, C. Gray, R. Nyaude, J. Kring, J. Clark, T. Shebs and H. Chamberlain. 2020. Magnetic orbital decay of solar-type binaries and creation implications. *CRSQ* 57:4–19.

The heavens were made by the word of the LORD, and all the stars, by the breath of His mouth. (Psalm 33:6 CSB)

Understanding Landscapes Using Biblical History

There are many interesting geologic landscapes around the world. How did they come to be? The secular world tries to explain them by rejecting the history we know from the Bible. Do the long ages and relatively uniform mechanisms they propose really provide a robust explanation? Or, does the biblical history help us find the context for understanding these features?

The Summer 2020 issue of the *CRSQ* has two articles exploring these questions. First, Johnson and Austin (2020) look at the granite Chaos at Huelgoat in Brittany. It is a jumble of huge granite boulders in a narrow valley. Geologic, archeological, and radiocarbon evidence are used to support the conclusion that this formation resulted from a relatively recent, catastrophic event—fitting well into the biblical timeline.

The second article is part 1 of a series looking at erosion near Mount St. Helens. This volcanic mountain is one of several along the Cascade Arc in Washington and Oregon, but is only the most recent addition onto the heavily eroded landscape. Comprised of folded strata, the basement rock has experienced significant erosion particularly evident in the Mount St. Helens region. Isaacs (2020) examines the evidence, estimates the amount of erosion, and concludes that only the global flood could explain such erosion.

Johnson, M. and M.J. Austin. 2020. The granite Chaos at Huelgoat in Brittany: The product of millions of years erosion, or a sudden catastrophe? *CRSQ* 57:20–29.

Isaacs, E.A. 2020. Tremendous erosion of the Cascade Anticlinorium near Mount St. Helens. *CRSQ* 57:30–44.

Look at the Birds and See the Glory of God

The Summer 2020 issue of the *CRSQ* also contains part II of a three-part series on developing and using baraminology techniques to help us understand the biological world. Baraminology is a creationary systematic that attempts to identify which organisms are related, in that they are descended from an originally created kind (Genesis 1:11–12, 21, 24–25). It is essential that we examine diversity within known baramins. This enables us to better understand how God designed life to vary.

As Drs. Ahlquist and Lightner (2020) explore landfowl (Order Galliformes) they note numerous details, including nesting habits, facial ornamentation, and feather coloration. Some traits vary considerably, while others do not. From their amazingly uniform bill structure to the feathered feet of the ptarmigan, these "chicken-like" birds testify to a Creator that cares for his creation.

Ahlquist, J. and J.K. Lightner. 2020. Strategies for more clearly delineating, characterizing, and inferring the natural history of baramins II: Evaluating diversity, with application to the order Galliformes (Class: Aves). *CRSQ* 57:45–56.

The LORD's works are great, studied by all who delight in them. All that He does is splendid and majestic; His righteousness endures forever. (Psalm 111:2–3 CSB)

Continued creation research is made possible by the generous gifts (time, money and prayer) of our many supporters. Thanks to all who have contributed!

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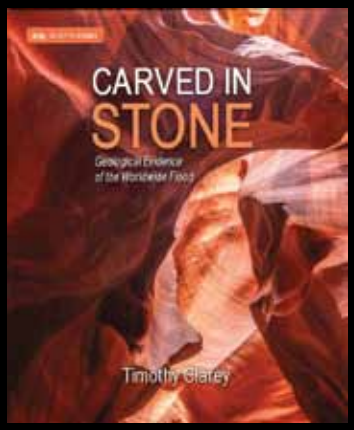
Carved in Stone: Geological Evidence of the Worldwide Flood

by Tim Clarey



Geologist Dr. Tim Clarey uses oil well and seismic data to analyze the rock record of Earth's past. Contrary to the current, popular interpretations of Earth's geology, Dr. Clarey explains how this data reveals that the earth experienced a worldwide flood just a few thousand years ago. Using full-color illustrations, *Carved in Stone* explains to the reader how the geologic evidence fits well with the Genesis account of creation and the flood.

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Praise: We thank God for a successful move! We appreciate all your prayers and support during the process. Thank you for your faithfulness!

Prayer: Please continue to pray for God's strength and guidance for Kevin and Diane Anderson, as well as the CRS board members. Also pray that God will raise up younger researchers to carry creation research forward!

Thanks Again!

The Creation Research Society CONFERENCE

July 23–24, 2021

We are excited to invite you to attend the 2021 CRS Conference. The conference will be held on the campus of Arizona Christian University (1 W. Firestorm Way, Glendale, AZ). As part of this year's conference, attendees will be able to tour the new Van Andel Creation Research Center as well as enjoy an optional special tour of the Grand Canyon. There are also options for on-campus housing.

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